

RESPONSE

Support

Applicants have amended claim 1 to include the limitations of claim 5 and claim 6 in an either or construction. Support comes from claims 5 and 6 themselves as well as page 3 lines 25-32 and page 5 lines 29 to 32 of the specification.

Applicants have cancelled claims 14-16.

No other elements of the claims have been amended.

Response

The Examiner has rejected claims 14-16 under 35 U.S.C. 112 as being indefinite. Applicants have cancelled these claims making the rejections moot.

The Examiner has also rejected claims 1-16 under 103(a) as being unpatentable over Malfer (US 5,725,612). The Examiner acknowledges that Malfer does not teach alpha- and beta- vinylidene groups in polyisobutylene however the Examiner concludes that it was known in the art at the time that alpha- and beta- vinylidenes are used, therefore it would have been obvious to one skilled in the art to use alpha- and beta- vinylidenes with the teachings of Malfer. In addition, the Examiner contends that would have also been obvious to one skilled in the art to use the conventional polyisobutylene of Malfer with the vinylidene polyisobutylene of Malfer. Applicants respectfully disagree.

Applicants note that Malfer teaches a fuel composition containing an additive comprising the Mannich reaction product of a polyisobutylene alkylated hydroxyaromatic compound, an aldehyde and an amine, wherein the polyisobutylene is a high reactive polyisobutylene/vinylidene polyisobutylene. In contrast, Applicants' invention teaches the use in a fuel composition of a Mannich reaction product that is prepared from the alkylated hydroxyaromatic compound, wherein the alkylated hydroxyaromatic compound is derived from a mixture of conventional polyisobutylene and a high reactive polyisobutylene.

Malfer only teaches the use of high reactive polyisobutylene to reduce IVD; Malfer does not teach or suggest using conventional polyisobutylene to reduce IVD. Furthermore, there is no suggestion in Malfer to combine conventional polyisobutylene with high reactive polyisobutylene to produce unexpectedly favorable IVD results.

Applicants have shown in Table 1 in the specification (see Examples 4 and 6) that mixing conventional polyisobutylene with high reactive polyisobutylene produces an as good as or better than IVD result when compared to either conventional polyisobutylene alone (see Example 3 on Table 1) or high reactive polyisobutylene alone (see Example 2 in Table 1). This performance is completely unexpected as one skilled in the

art would not anticipate that mixing conventional polyisobutylene, which produces relatively poor IVD results (see Example 3 on Table 1), with high reactive polyisobutylene, which produces improved IVD results, to make the Mannich additive would produce still further improved IVD results. As a consequence of this surprising result, Applicants submit that the present invention is both novel and non-obvious over the reference.

In other words, even if Malfer provides sufficient teaching that one skilled in the art would know he could mix conventional polyisobutylene and high reactive polyisobutylene, he would not have motivation to do so and would not expect the resulting improvement in IVD results. Rather, Malfer and the comparative data in the present application show that one skilled in the art would expect an additive produced from a mixture of conventional and high reactive polyisobutylene to provide IVD results between those obtained by conventional polyisobutylene alone and those obtained by high reactive polyisobutylene alone (a middle result somewhere between the two end points). Surprisingly, the data in the specification shows that such a mixture provides comparable or improved IVD results over the high reactive polyisobutylene derived additive (an unexpected peak).

Based on this surprising result, Applicants respectfully submit that the present claims are both novel and non-obvious over Malfer and ask that the rejections be removed.

Conclusion.

For the foregoing reasons it is submitted that the present claims are novel and non-obvious, and in condition for allowance. The foregoing remarks are believed to be a full and complete response to the outstanding office action. Therefore an early and favorable reconsideration is respectfully requested. If the Examiner believes that only minor issues remain to be resolved, a telephone call to the Undersigned is suggested.

Any required fees or any deficiency or overpayment in fees should be charged or credited to deposit account 12-2275 (The Lubrizol Corporation).

Respectfully submitted,

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